

Application No. 09/719,907
Amendment dated April 17, 2003
Reply to Office Action of December 18, 2002

Amendments to the Claims:

Claim 1. (currently amended) A method for measuring the displacement of a fluid in a conduit [(3)], having two transducers offset along a main axis of the conduit [by calculating a difference in ultrasound transit time between two transducers (1, 2; 12, 13) in one direction and in the other], the method comprising the steps of [characterised by the steps]:

[of] simultaneously exciting the two transducers [(1, 2; 12; 13)] using a single exciting circuit, [then]

simultaneously measuring signals received at each one of the transducers originating from the other transducer,

synchronously digitizing the signals received at each one of both transducers, and calculating a difference in ultrasound transit time between the two transducers in one direction and in the other.

Claim 2. (canceled without prejudice)

Claim 3. (currently amended) The method according to claim 1, wherein the step of calculating [characterised in that calculation of the difference in transit time] comprises intercorrelating signals received at each one of the transducers and seeking an intercorrelation maximum.

Claim 4. (currently amended) The method according to claim 1, wherein the step of calculating [characterised in that the calculation of the difference in transit time]

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comprises intercorrelating received signals, calculating the Hilbert transform of intercorrelation, and seeking zeros of the Hilbert transform.

Claim 5. (currently amended) The method according to claim 4, wherein [characterised in that]the seeking of zeros is performed by polynomial interpolation of the Hilbert transform, preferably by interpolation using a third degree polynomial.

Claim 6. (currently amended) The method according to claim 1, further comprising [characterised in that it comprises]a step of calibrating[on step] by measuring ultrasound propagation time outside the flowing fluid[vein].

Claim 7. (currently amended) The method according to claim 6, wherein the step of calibrating [characterised in that the calibration step]comprises successive measurement of transit time between the transducers for two fluids of different and known velocities.

Claim 8. (currently amended) The method according to claim 1, further comprising [characterised in that it comprises]a step of correcting values of ultrasound propagation time outside the flowing fluid[vein], as a function of temperature.

Claims 13-24 (canceled without prejudice).

Rule 1.126 28 25. (new) A method for measuring the displacement of a fluid in a conduit, having two transducers offset along a main axis of the conduit, the method comprising the steps of:

simultaneously exciting the two transducers,

simultaneously measuring signals received at each one of the transducers

originating from the other transducer,

synchronously digitizing the signals received at each one of both transducers, and

calculating a difference in ultrasound transit time between the two transducers in one direction and in the other, by intercorrelating received signals, calculating the Hilbert transform of intercorrelated signals, and seeking zeros of the Hilbert transform.

29 ~~26~~²⁸ (new) The method according to claim ~~25~~²⁸, wherein the step of simultaneously exciting uses a single exciting circuit.

30 ~~27~~²⁸ (new) The method according to claim ~~25~~²⁸, wherein the seeking of zeros is performed by polynomial interpolation of the Hilbert transform, preferably by interpolation using a third degree polynomial.

31 ~~28~~²⁹ (new) The method according to claim ~~26~~²⁹, wherein the seeking of zeros is performed by polynomial interpolation of the Hilbert transform, preferably by interpolation using a third degree polynomial.

32 ~~29~~²⁸ (new) The method according to claim ~~25~~²⁸, further comprising a step of calibrating by measuring ultrasound propagation time outside the flowing fluid.

C) 33 ~~30~~³² (new) The method according to claim ~~29~~³², wherein the step of calibrating comprises successive measurement of transit time between the transducers for two fluids of different and known velocities.

34 ~~31~~²⁸ (new) The method according to claim ~~25~~²⁸, further comprising a step of correcting values of ultrasound propagation time outside the flowing fluid, as a function of temperature.